

* Used when dividing by $(x - \#)$

$$(x^3 + 2x^2 - 6x - 9) \div (x + 3)$$

coefficient

$(x - (-3))$

$$\begin{array}{r|rrrr} -3 & 1 & 2 & -6 & -9 \\ & & -3 & 3 & 9 \\ \hline & 1 & -1 & -3 & 0 \end{array}$$

$x^2 - x - 3$ 0

$$(2x^4 + 3x^3 \overset{0x^2}{\downarrow} - 4x - 6) \div (x+2) \quad \swarrow (x-2)$$

$$\begin{array}{r|rrrrrr} -2 & 2 & 3 & 0 & -4 & -6 \\ & \downarrow & -4 & 2 & -4 & 16 \end{array}$$

$$2x^3 - 1x^2 + 2x - 8 \text{ R } 10$$

③

$$(4x^2 + 20x + 24) \div (x+3) \quad \swarrow \quad (x-3)$$

$$\begin{array}{r|rrr} -3 & 4 & 20 & 24 \\ & \downarrow & -12 & -24 \\ \hline & 4 & 8 & 0 \end{array}$$

$$\boxed{4x + 8}$$

$$\textcircled{4} (2x^2 + 7x - 15) \div \underline{\underline{(x-5)}}$$

$$5 \mid \begin{array}{ccc} 2 & 7 & -15 \end{array}$$

$$\downarrow \quad 10 \quad 85$$

$$\begin{array}{ccc} 2 & 17 & 60 \end{array}$$

$2x + 17 \quad r 60$

⑤ $(x^2 - 9) \div (x + 7) \leftarrow (x - (-7))$

-7		1	0	-9
		↓	-7	49
<hr/>				
		1	-7	40

$x - 7 \quad R40$

⑥ $(x^4 + 2x^3 - 10x - 9) \div (x+5)$

\swarrow $(x - (-5))$

-5		1	2	0	-10	-9
		↓	-5	15	-75	425
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		1	-3	15	-85	416

$$x^3 - 3x^2 + 15x - 85 \text{ R } 416$$

FACTORING POLYNOMIALS

6.4

$$\textcircled{1} -4x(3x^2+2x-3)$$

$$\rightarrow -12x^3 - 8x^2 + 12x$$

$$\textcircled{2} 2x + 5x^2(2x^2 - 4x + 9)$$

$$2x + 10x^4 - 20x^3 + 45x^2$$

$$\textcircled{3} (x+4)(x^2-3x)$$

$$x^3 - \underbrace{3x^2 + 4x^2}_{x^2} - 12x$$

$$\rightarrow x^3 + x^2 - 12x$$

$$x(x^2 + x - 12)$$

$$(\quad)(\quad)$$

GCF

① Determine GCF
and write outside ()

$$\begin{array}{r} 10y^2 - 5y \\ 5y(2y - 1) \end{array}$$

② Divide each term
by GCF

$$\begin{array}{r} y(10y - 5) \\ 5y(2y - 1) \end{array}$$

$$\textcircled{1} 3ab^3 + 9a^2b^2$$

$$3ab^2(b + 3a)$$

$$\textcircled{2} 5xy^2 + 20xyz - 15x^3y^4$$

$$5xy(y + 4z - 3x^2y^3)$$

$$\textcircled{3} \quad 3x^4 - 12x^3$$

$$3x^3(x - 4)$$

Ex:

$$\textcircled{1} 2a(2a+1)$$

$$* \textcircled{2} 3(\underline{y^2 - y - 3}) = 3(y)(y)$$

$$\textcircled{3} 4xy(x-3y)$$

$$\textcircled{4} 2x(4y+5z-7w)$$

Form: $x^2 + bx + c$

① $x^2 - 4x - 21$

$(x - 7)(x + 3)$

$-7 \quad 3$

$7 \quad -3$

$21 \quad -1$

② $x^2 + 2x - 35$

$(x - 5)(x + 7)$

$$\textcircled{3} (x-6)(x-3)$$

$$\textcircled{4} (x-7)(x+7) \quad x^2+0x-49$$

$$\textcircled{5} (x+1)(x+1)$$

$$\textcircled{6} (x-6)(x+5)$$

$$\textcircled{7} (x+10)(x+2)$$

$$\textcircled{8} (x-6)(x+6) \quad x^2+0x-36$$

$$\textcircled{9} (x-3)(x-2)$$

$$\textcircled{10} (x-7)(x-3) \quad = (x^2-10x+21)$$

$$\textcircled{11} (x+2)(x+2)$$

$$\textcircled{12} (x-4)(x-5) \\ (x-5)(x-4)$$

Form: $ax^2 + bx + c$

$$\textcircled{1} 3a^2 - 12a - 24$$

$$(3a \begin{array}{c} \cancel{12} \cancel{12} \\ \cancel{4} \cancel{4} \\ 12 \end{array}) (a \begin{array}{c} \cancel{12} \cancel{12} \\ \cancel{4} \cancel{4} \\ 12 \end{array})$$

$$\cancel{6} \cancel{4}$$

$$\cancel{12} \cancel{6}$$

$$\cancel{8} \cancel{3}$$

$$\cancel{3} \cancel{8}$$

$$\cancel{2} \cancel{12}$$

$$\cancel{12} \cancel{2}$$

$$\textcircled{2} \quad 2t^2 + 8t - 24$$

$$(2t - 4)(t + 6)$$

~~8 3~~

~~3 8~~

~~6 4~~

4 6

12 2

2 12



③

$$2x^2 - 5x - 12$$

$$\begin{array}{r} 2 \quad +6 \\ 1 \quad -2 \end{array}$$

$$\begin{array}{r} -6 \\ 4 \\ \hline +2 \end{array}$$

$$\begin{array}{r} 2 \quad +2 \\ 1 \quad -6 \end{array}$$

$$\begin{array}{r} +2 \\ -12 \\ \hline -10 \end{array}$$

$$\begin{array}{r} 2 \quad +3 \\ 1 \quad -4 \end{array}$$

$$\begin{array}{r} +8 \\ +3 \\ \hline -5 \end{array}$$

$$(2x+3)(x-4)$$

$$\textcircled{4} 3x^2 - 13x - 10$$

$$\begin{array}{r} 3 \times -5 \\ 1 \times 2 \end{array} \quad \begin{array}{r} 6 \\ -5 \\ \hline 1 \end{array}$$

$$\begin{array}{|c|c|} \hline 3 & +2 \\ \hline 1 & -5 \\ \hline \end{array} \quad \begin{array}{r} +15 \\ +2 \\ \hline -13 \end{array}$$

$$(3x+2)(x-5)$$

$$\textcircled{8}^* (3m)(2m)$$

$$(6m)(m)$$

$$16a^2$$

$$\textcircled{10} (4a)(4a)$$

$$16$$

$$1$$

$$4$$

$$4$$

HW:

p. 366 #28, 30, 32 (synth. div.)

p. 348 #18-26 even (GCF)

* finish wksht on factoring
in notes